Development of a Regional Fish Index for Seven Large Rivers in EPA Region V Erich Emery, ORSANCO

We followed a probabilistic design to conduct fish sampling on 7 Region V rivers during the summers of 2004-2006 as part of the Regional Environmental Monitoring and Assessment Program (REMAP). Fish populations were surveyed from 3 tributaries to the Upper Mississippi River (Minnesota, St. Croix, and Wisconsin rivers), and 4 tributaries to the Ohio River (Illinois, Muskingum, Scioto, and Wabash rivers) via night and day boat electrofishing. The data from 206 sample sites was used to generate the Fish Assemblage Condition Index (FACI). A principal components analysis of associated instream habitat and simple water quality data was used to determine least impacted sites. We evaluated 113 candidate fish metrics for range, responsiveness, and redundancy. The final index included 12 metrics and had a maximum score of 100. The FACI accurately measured the relative condition of the 7 rivers, as indicated by a comparison of calibration and validation subsets. FACI scores were positively correlated with individual state IBI indices (Spearman rank r = 0.64). However, relative to the state IBI scores the FACI consistently underestimated condition. We propose this discrepancy is an artifact of increasing range of condition when moving to a larger spatial scale. We recommend caution when applying an index and comparing results from 2 different spatial scales.

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